

How to combine safety and fast charging (stations)

Nicolas Dupont / Dr Laurent Tribut
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A world of standards...



Charging station related standards

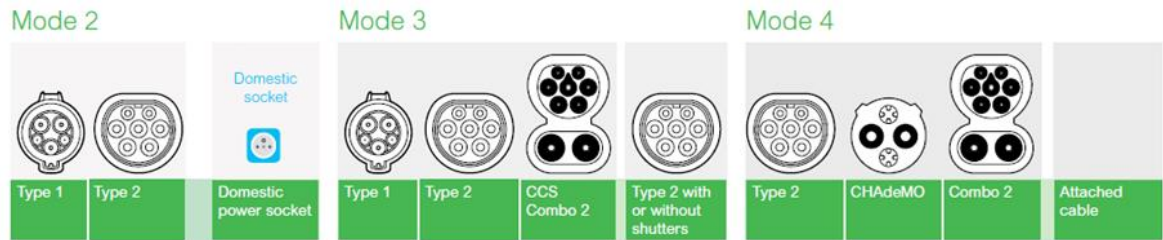
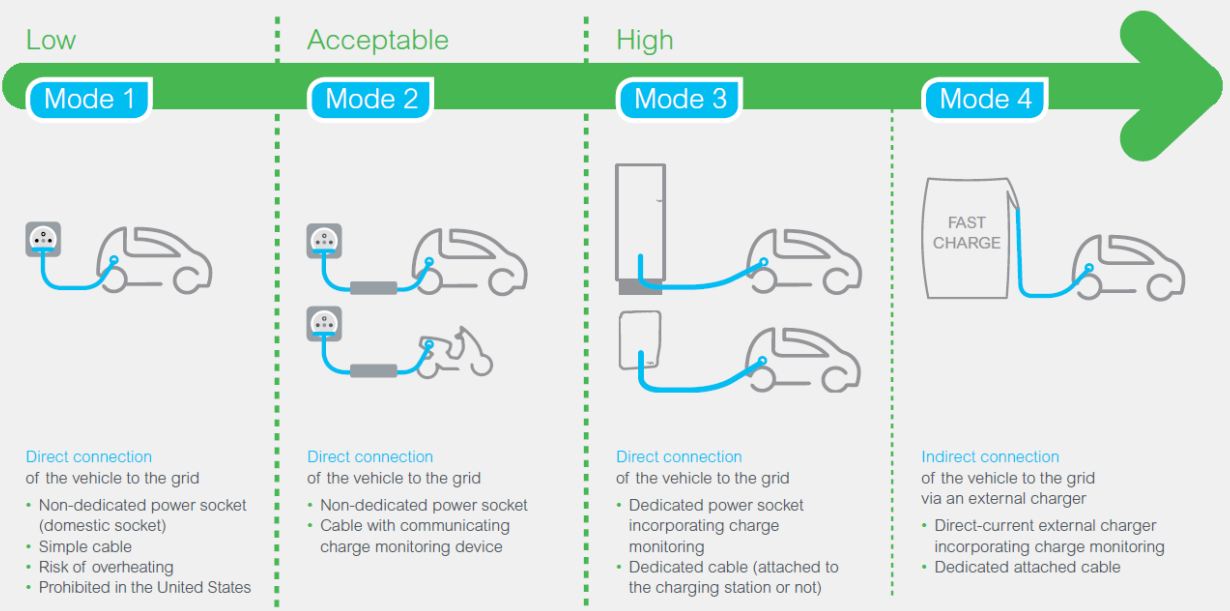
IEC	UL	SAE
61851	2594	J2293
	2231	
	2202	

Charging plug and sockets related standards

IEC	UL	SAE
62196	2251	J1772

...still under harmonization

Different electrical ratings* ...



*According to IEC 61851 definition

Source used	Domestic power socket	Dedicated DC power socket
Power	Single-phase: 2.3 kW	Three-phase: 24 kW
Time to "fill up"	18 h	2 h
% of charge reached in 30 min	3%	25%

Source used	Dedicated AC power socket	
Power	Single-phase: 7.4 kW	Three-phase: 22 kW
Time to "fill up"	7 h	2h30 min
% of charge reached in 30 min	7%	20%

...Different charging modes

Evlink AC product overview



Wallbox



- Socket outlet / attached cable
- Indoor/Outdoor
- Stop/start button with lighting indications
- **Plastic cover**
- Easy to install (<30 min)
 - On the wall, on a pole
- Key lock access control
- Energy management
 - Deferred start or charging current limitation
- Pedestal



Smart Wallbox



- RFID authentication
- Easy commissioning
 - use of a laptop connected to the embedded webserver
- Back-end connection via OCPP
- **LMS**
- Management of 5 to 100 Charging Station
- Management of authorization and access
- Dynamic load management based on energy availability and cost



Parking

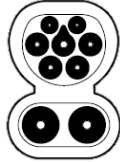


- 2 charging points on the same unit
- **Metal enclosure**
- Installation of protection devices in the floor base
- Energy management
 - Load management per socket outlet or for the charging station
 - Automated load balancing for dual sockets & load shedding

EVlink DC 24kW

to charge all EV in ~1h to 1h30

Single charge point



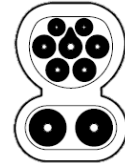
CCS Combo2

or



CHAdeMO

Multi charge points



CCS Combo2

&



CHAdeMO

+



T2S
as an option



Economic solution
vs 50kW chargers



Easy installation
in less than 2h,
either on a wall or
on a pedestal



Smart power
Upgrades and operation
can be done remotely



Robust design
Ideal for outdoor use
IP54 / IK10



Low maintenance
thanks to innovative
cooling system
without air filter

Life Is On

Schneider
Electric

IEC 61851-1 requirements – Enclosure

- Insulation resistance
- Touch current
- AC withstand voltage
- Impulse dielectric withstand



ISO 4892-2 method A
cycle 1: 500h followed
by flexural and Charpy
tests



IK 08



REACH/ROHS
Halogen free (internal policy)



PC UV stabilized
cost effective
technical solution



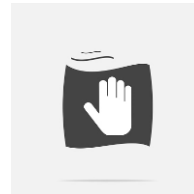
IP 41 indoor
IP 44 outdoor



-5°C indoor
-25°C outdoor



Glow wire FI: 650°C



Marking durability 15s cleaning with
water and 15s with petroleum spirit

IEC 62196-1 and-2 requirements – Plug and sockets

- Insulation resistance
- Dielectric strength
- PTI: 175V



7 days at 91 to 95%RH – 20 to 30°C followed by insulation resistance and dielectric strength
Pollution degree 3



-30°C to 50°C
Ageing 70°C - 10 days for rubber
Ageing 80°C - 7 days for TP

Table 20 – Impact energy for ball impact test

Rating A	Energy J	
	Vehicle inlets	Socket-outlets
Up to and including 32	1	1
Above 32 and up to and including 100	2	2
Above 100 and up to and including 150	3	3
Above 150 and up to and including 400	4	4

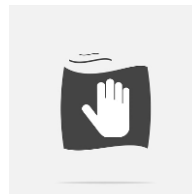


IK 10



Touch Temperature at In: 60 to 80°C
1 h at 110°C
Ball pressure: 80 to 125°C
Glow wire FI: 650°C to 850°C

REACH/ROHS
Halogen free (internal policy)



Marking durability 15s cleaning with water and 15s with petroleum spirit

Focus on flammability requirements in UL 2594

	Details	Flammability rating
Enclosures	Portable equipment	V1
	Stationary equipment	V1
	Movable equipment	5V
	Permanent equipment	5V
Internal parts	not intended for direct support of live parts	Min V2 or product insulation rating
	Far from uninsulated parts	No rating
External parts	Considered as decorative	Min HB
Printed wiring board		Min V2
Cables		Min FT2

} Burner of **500W** instead of 50W for UL94V rating

Focus on flammability requirements in UL 2202

If enclosure has a projected surface $> 0,93\text{m}^2$ or one dimension $> 1,83\text{m}$



UL 723 “Steiner tunnel test”

or



ASTM E162 “radiant panel”

Flame spread rating < 200

Conclusion

- Several standards apply on EV charging station and plug/sockets but there is a lack of harmonization
- UL requirements for flammability are significantly most stringent than IEC
- IEC requirements should be achievable with recycle materials

Thank you very much for your attention
Do you have some questions?